

WHAT IS CLAIMED IS:

1. A method for reducing undesired interference from a radio signal source in a wireless radio communication system comprising Radio Base Stations and mobile stations, each Radio Base Station having a multiple of antenna elements (1), which antenna elements (1) are mounted in each others vicinity such that their beam patterns have a predetermined overlap,

characterised in that, the bearing of the area of the overlap of the beam patterns in a substantial horizontal plane of at least two of the antenna elements (1) is adjustable, depending on interference measurements deployed by an interference control (7) controlling a bearing of the at least two or more beam patterns of the said two or more antenna elements (1).

2. The method according to claim 1, wherein the bearing of the overlap of the beam patterns in a substantial horizontal plane of at least two antenna elements (1) is controlled by interference control (7) such that the bearing substantially coincides with a position of the interfering signal source.

3. The method according to claim 2, wherein the overlap of the beam patterns in a substantial horizontal plane are beam patterns from two adjacent positioned antenna elements (1).

4. The method according to claim 3, wherein the bearing of the overlap of the beam patterns in a substantial horizontal plane, being the overlap formed by beam patterns from two adjacent positioned antenna elements (1), depends on the signal strength of the interfering signal source, received by said two adjacent positioned antenna elements (1).

5. The method according to any of claims 1 to 4, wherein the area of the overlap of the beam patterns in a substantial horizontal plane is adjustable, depending on the interference measurements deployed by an interference control (7) controlling a bearing of one or more beam

patterns of one or more antenna elements (1).

6. The method according to any of claims 1 to 5, wherein the phase of one or more signals, received by antenna elements (1), is adapted by controllable phase shift elements (5), and fed to the Radio Base Station, where the amount of phase adapting depends on the interfering signal of the interfering signal source.

7. The method according to any of claims 1 to 6, wherein the one or more of antenna elements (1) are tilted, where the amount of tilting depends on the interfering signal of the interfering signal source.

8. The method according to claim 1, comprising the steps of:

- detecting by measurement an occurrence of an interfering signal at two or more antenna elements (1) above a threshold value and store the value of the measured interfering signal;

- selecting two adjacent antenna elements (1) having an overlap of their beam patterns, which antenna elements (1) receive the two highest interfering signal values and storing the average value of said interfering signals;

- adjusting a bearing of the overlap of the two beam patterns of the two selected adjacent antenna elements (1), such that the bearing slides a step in a direction from the antenna element (1) with the second highest received interfering signal the antenna element (1) with the highest received interfering signal, by adjusting said two antenna elements (1) controlled by tilt/bearing control (6), under control by interference control (7) in said direction;

- measuring a new value of the interfering signal and comparing the new value of the interfering signal with the value of the stored interfering signal and storing the new value;

- repeating the adjusting step as long as the measured interfering signal has a value above or equal to the threshold value;

- stopping if a new measured interfering signal has a value

below the threshold value, adjust the bearing of the overlap of the two beam patterns of the two selected adjacent antenna elements (1) to a predetermined default value.

9. The method according to all preceding claims where the adjustment beam patterns of the antenna elements (1) is performed mechanically.

10. The method according to all preceding claims wherein the method is deployed in a cellular communication system.

11. A method for reducing undesired interference from a radio signal source in a wireless radio communication system comprising Radio Base Stations and mobile stations, each Radio Bases Station having a multiple of antenna elements (1), which antenna elements (1) are mounted in each others vicinity such that their beam patterns have a predetermined overlap,

characterised in that, the area of the overlap of the beam patterns in a substantial horizontal plane of at least two of the antenna elements (1) is adjustable, depending on interference measurements deployed by an interference control (7) controlling a bearing of the one or more beam patterns of said one or more antenna elements (1).

12. The method according to claim 11, wherein the area of the overlap of the beam patterns in a substantial horizontal plane of at least two antenna elements (1) is controlled by interference control (7) such that the area substantially coincides with a position of the interfering signal source.

13. The method according to claim 12, wherein the overlap of the beam patterns in a substantial horizontal plane are beam patterns from two adjacent positioned antenna elements (1).

14. The method according to claim 13, wherein the area of the overlap of the beam patterns in a substantial horizontal plane, being the overlap formed by beam patterns from two adjacent positioned antenna elements (1), depends on the signal strength of the interfering signal

source.

15. The method according to claims 11 to 14, wherein the bearing of the overlap of the beam patterns in a substantial horizontal plane is adjustable, depending on the interference measurements deployed
5 by an interference control (7) controlling a bearing of two or more beam patterns of two or more adjacent positioned antenna elements (1).

16. The method according to any of claims 11 to 15, wherein the phase of one or more signals, received by antenna elements (1), is adapted by controllable phase shift elements (5), and fed to the Radio
10 Base Station, where the amount of phase adapting depends on the interfering signal of the interfering signal source.

17. The method according to any of claims 11 to 16, wherein the one or more of antenna elements (1) are tilted, where the amount of tilting depends on the interfering signal of the interfering signal
15 source.

18. The method according to claim 11, comprising the steps of:

- detecting by measurement an occurrence of an interfering signal at two or more antenna elements (1) above a threshold value and store the value of the measured interfering signal;

20 - selecting two adjacent antenna elements (1) having an overlap of their beam patterns, which antenna elements (1) receive the two highest interfering signal values and storing the average value of said interfering signals;

- adjusting an area of the overlap of the two beam patterns
25 of the two selected adjacent antenna elements (1), such that the area is reduced, by adjusting the antenna element (1) with the highest received interfering signal into a direction from the antenna element (1) with the second highest received interfering signal, wherein the adjustment is controlled by tilt/bearing control (6), under control by interference
30 control (7) in said direction;

- measuring a new value of the interfering signal and

comparing the new value of the interfering signal with the value of the stored interfering signal and storing the new value;

- adjusting subsequently an area of the overlap of the two beam patterns of the two selected adjacent antenna elements (1), such that the area is reduced, by adjusting the antenna element (1) with the highest received interfering signal into a direction from the antenna element (1) with the second highest received interfering signal, if the new received interfering signal is lower than the stored interfering signal, or oppositely increase the area if the if the new received interfering signal is higher than the stored interfering signal;

- repeating the adjusting step as long as the measured interfering signal has a value above or equal to the threshold value;

- stopping if a new measured interfering signal has a value below the threshold value, adjust the bearing of the overlap of the two beam patterns of the two selected.

19. The method according to claim 18, wherein the adjusting steps are executed on the two selected antenna elements (1).

20. The method according to claims 11 to 19 where the adjustment beam patterns of the antenna elements (1) is performed mechanically.

21. The method according to claims 11 to 20 wherein the method is deployed in a cellular communication system.

22. An interference control system within a wireless radio communication system, the control system comprising two or more sets of antenna elements (1) having adjustable beam patterns in a substantial horizontal plane, the two or more sets further comprising phase shift devices (5) communicatively connected to the respective antenna element (1) and receiving a first signal from the respective antenna element (1) and providing said first signal with an amount of phase shift to a Radio Base Station's receiving side, the control system further comprising beam pattern adjustment devices (4) controlled by a tilt/bearing control (6)

under control of an interference control (7), where the interference control (7) has inputs for receiving interference information from a Radio Base station Controller and the first signal with an amount of phase shift from the phase shift devices (5), and where the interference control has outputs to control the tilt/bearing control (6) and the phase shift devices (5), and where the interference control (7) is adapted to deploy the method from claim 1.

23. The device according to claim 22, wherein the beam pattern adjustment devices are mechanical actuators.

24. The device according to claim 23, wherein the beam pattern adjustment devices are electronic arrangements.

25. A Radio Base Station within a cellular communication network, comprising the interference control system of any of claims 22 to 24.

26. An interference control system within a wireless radio communication system, the control system comprising two or more sets of antenna elements (1) having adjustable beam patterns in a substantial horizontal plane, the two or more sets further comprising phase shift devices (5) communicatively connected to the respective antenna element (1) and receiving a first signal from the respective antenna element (1) and providing said first signal with an amount of phase shift to a Radio Base Station's receiving side, the control system further comprising beam pattern adjustment devices (4) controlled by a tilt/bearing control (6) under control of an interference control (7), where the interference control (7) has inputs for receiving interference information from a Radio Base station Controller and the first signal with an amount of phase shift from the phase shift devices (5), and where the interference control has outputs to control the tilt/bearing control (6) and the phase shift devices (5), and where the interference control (7) is adapted to deploy the method from claim 11.

27. The device according to claim 22, wherein the beam pattern

adjustment devices are mechanical actuators.

28. The device according to claim 23, wherein the beam pattern adjustment devices are electronic arrangements.

29 A Radio Base Station within a cellular communication
5 network, comprising the interference control system of any of claims 26
to 28.